PNP general purpose transistors BC859; BC860

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 45 V).

APPLICATIONS

- Low noise input stages of audio frequency equipment.

DESCRIPTION

PNP transistor in a SOT23 plastic package.
NPN complements: BC849 and BC850.

MARKING

TYPE NUMBER	MARKING CODE(1)	TYPE NUMBER	MARKING CODE(1)
BC859B	4B*	BC860B	4F*
BC859C	4C*	BC860C	4G*

Note

1. * = p : Made in Hong Kong.
   * = t : Made in Malaysia.

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

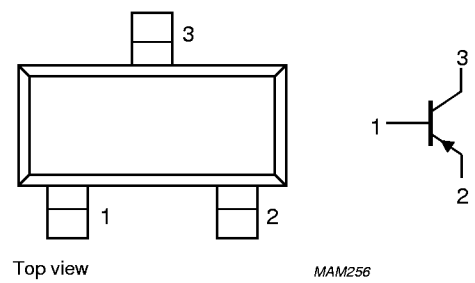


Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter			
	BC859		–	–30	V
	BC860		–	–50	V
V_{CEO}	collector-emitter voltage	open base			
	BC859		–	–30	V
	BC860		–	–45	V
V_{EBO}	emitter-base voltage	open collector	–	–5	V
I_C	collector current (DC)		–	–100	mA
I_{CM}	peak collector current		–	–200	mA
I_{BM}	peak base current		–	–200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Note

1. Transistor mounted on an FR4 printed-circuit board.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

1. Transistor mounted on an FR4 printed-circuit board.

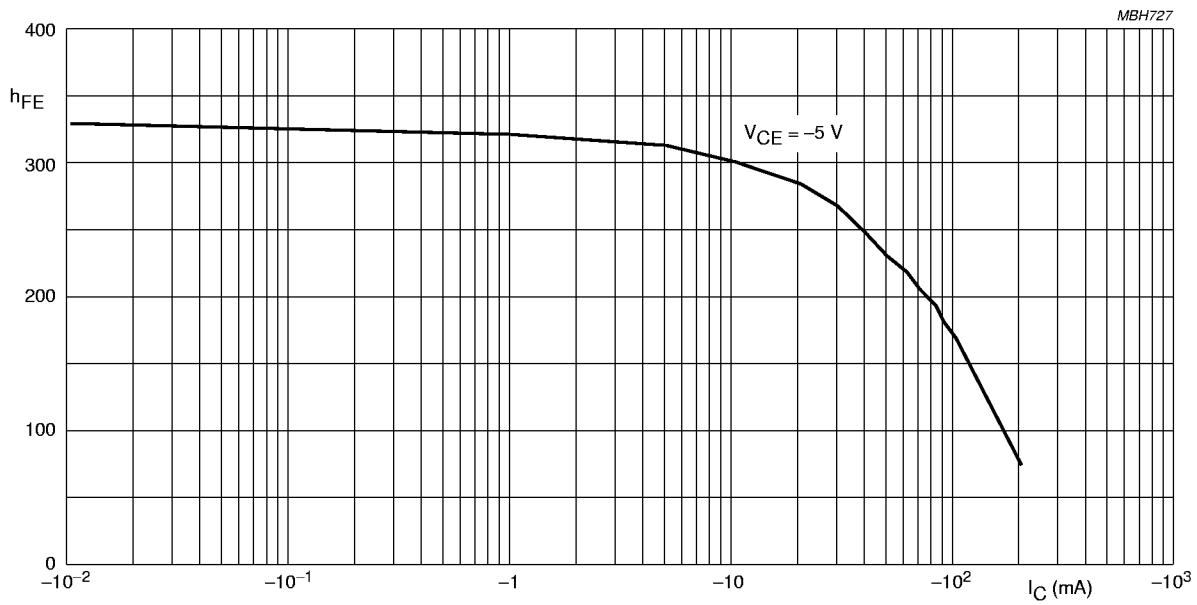
CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	I_E = 0; V_{CB} = –30 V	–	–1	–15	nA
		I_E = 0; V_{CB} = –30 V; T_j = 150 °C	–	–	–4	µA
I_{EBO}	emitter cut-off current	I_C = 0; V_{EB} = –5 V	–	–	–100	nA
h_{FE}	DC current gain BC859B; BC860B BC859C; BC860C	I_C = –2 mA; V_{CE} = –5 V; see Figs 2 and 3	 220 420	 – –	 475 800	
V_{CEsat}	collector-emitter saturation voltage	I_C = –10 mA; I_B = –0.5 mA	–	–75	–300	mV
		I_C = –100 mA; I_B = –5 mA	–	–250	–650	mV
V_{BEsat}	base-emitter saturation voltage	I_C = –10 mA; I_B = –0.5 mA; note 1	–	–700	–	mV
		I_C = –100 mA; I_B = –5 mA; note 1	–	–850	–	mV
V_{BE}	base-emitter voltage	I_C = –2 mA; V_{CE} = –5 V; note 2	–600	–650	–750	mV
		I_C = –10 mA; V_{CE} = –5 V; note 2	–	–	–820	mV
C_c	collector capacitance	$I_E = i_e$ = 0; V_{CB} = –10 V; f = 1 MHz	–	4.5	–	pF
C_e	emitter capacitance	$I_C = i_c$ = 0; V_{EB} = –500 mV; f = 1 MHz	–	10	–	pF
f_T	transition frequency	I_C = –10 mA; V_{CE} = –5 V; f = 100 MHz	100	–	–	MHz
F	noise figure BC859B; BC860B; BC859C; BC860C	I_C = –200 µA; V_{CE} = –5 V; R_S = 2 kΩ; f = 30 Hz to 15 kHz	–	–	4	dB
	noise figure BC859B; BC860B; BC859C; BC860C	I_C = –200 µA; V_{CE} = –5 V; R_S = 2 kΩ; f = 1 kHz; B = 200 Hz	–	–	4	dB

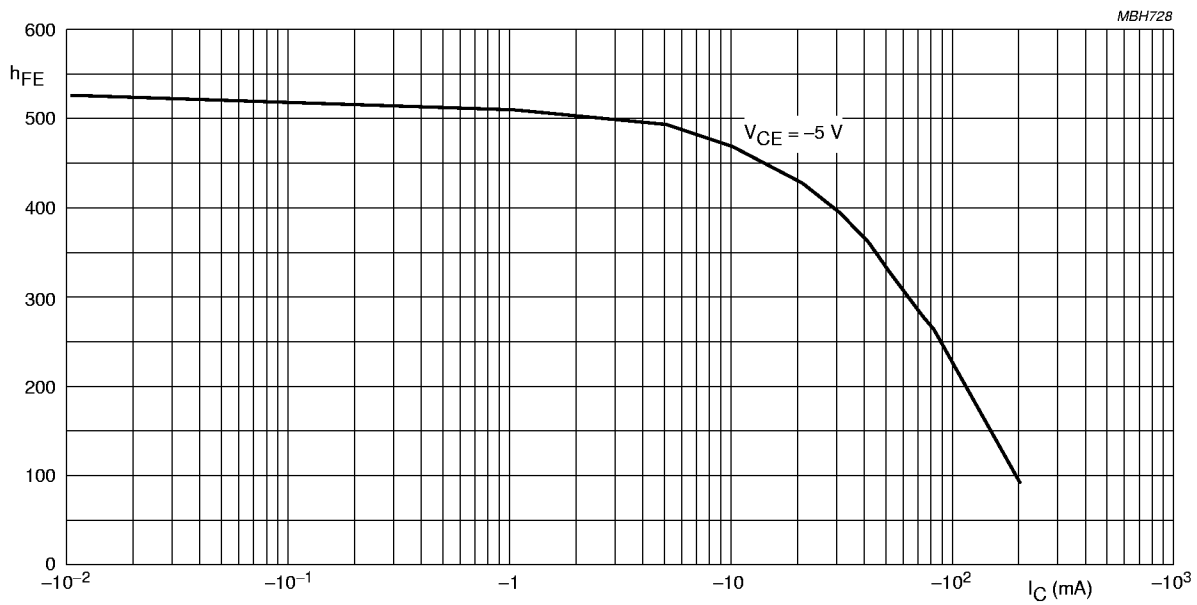
Notes

1. V_{BEsat} decreases by about –1.7 mV/K with increasing temperature.
2. V_{BE} decreases by about –2 mV/K with increasing temperature.



BC859B; BC860B.

Fig.2 DC current gain; typical values.

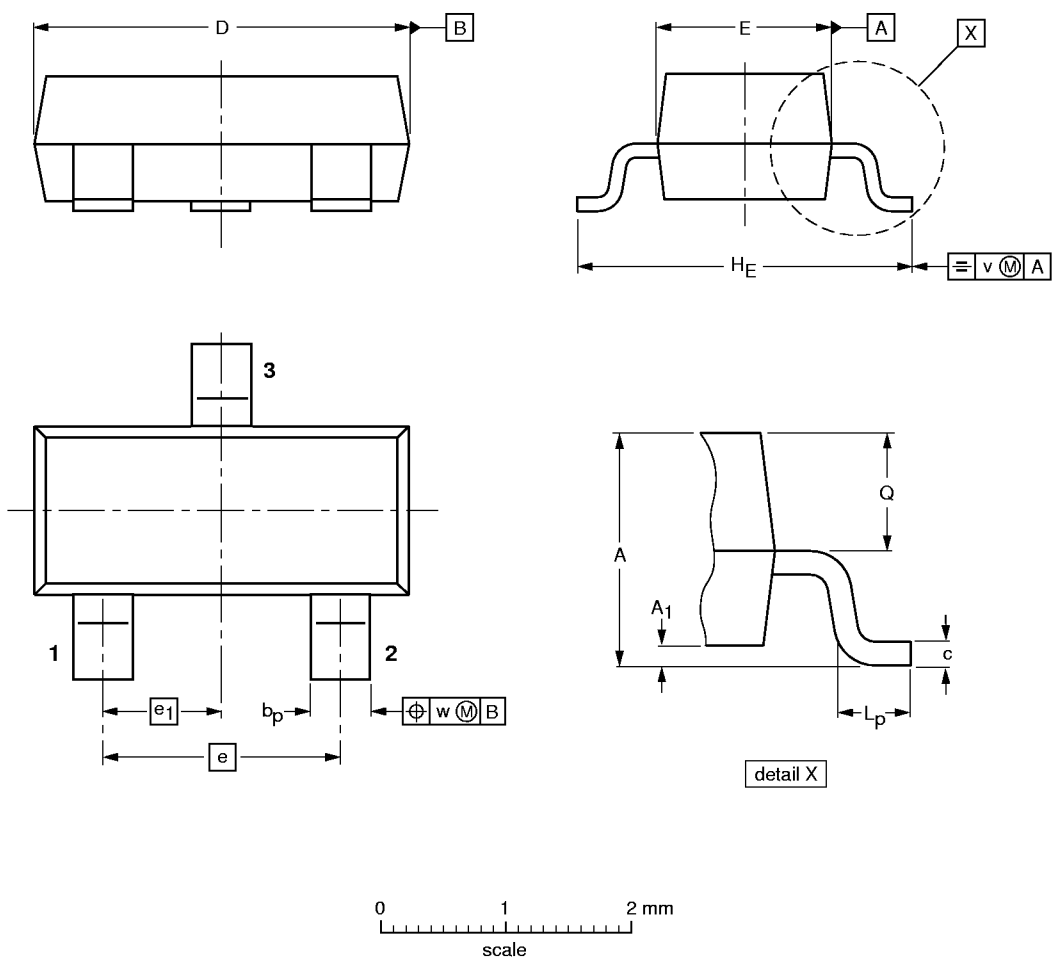


BC859C; BC860C.

Fig.3 DC current gain; typical values.

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT23**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT23						97-02-28